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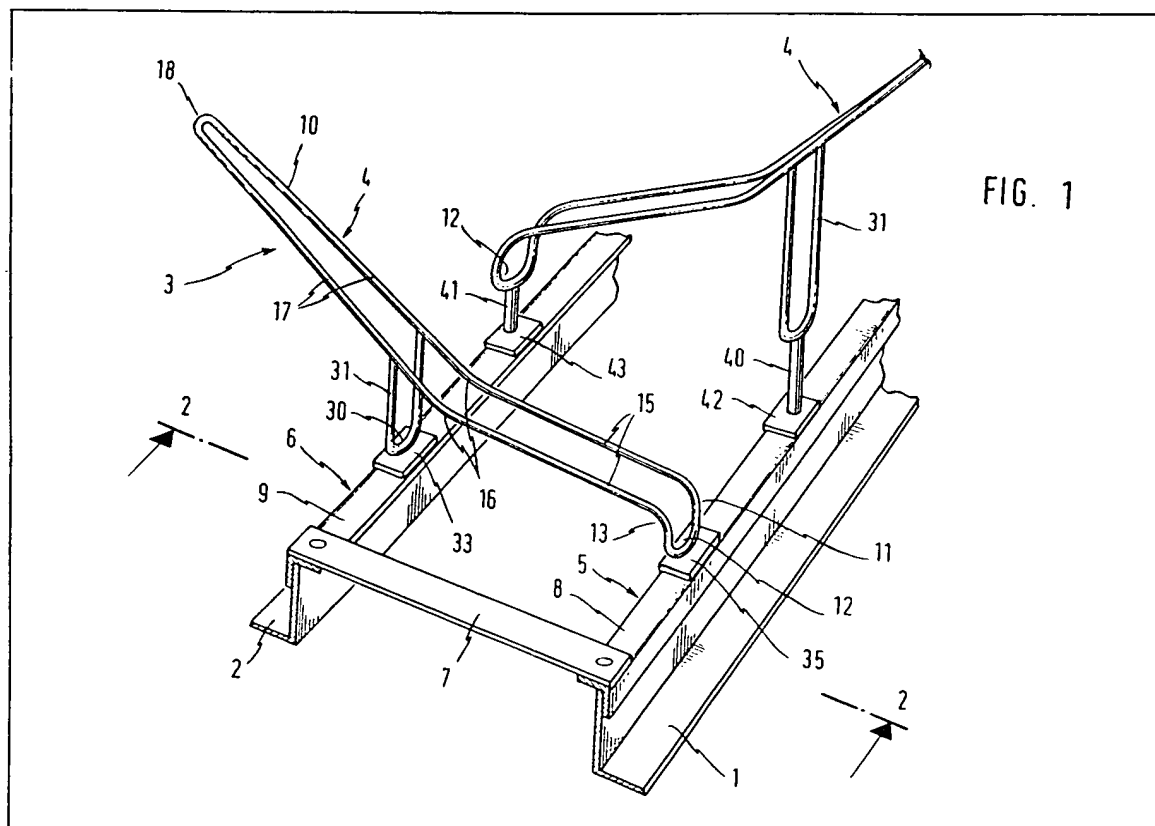
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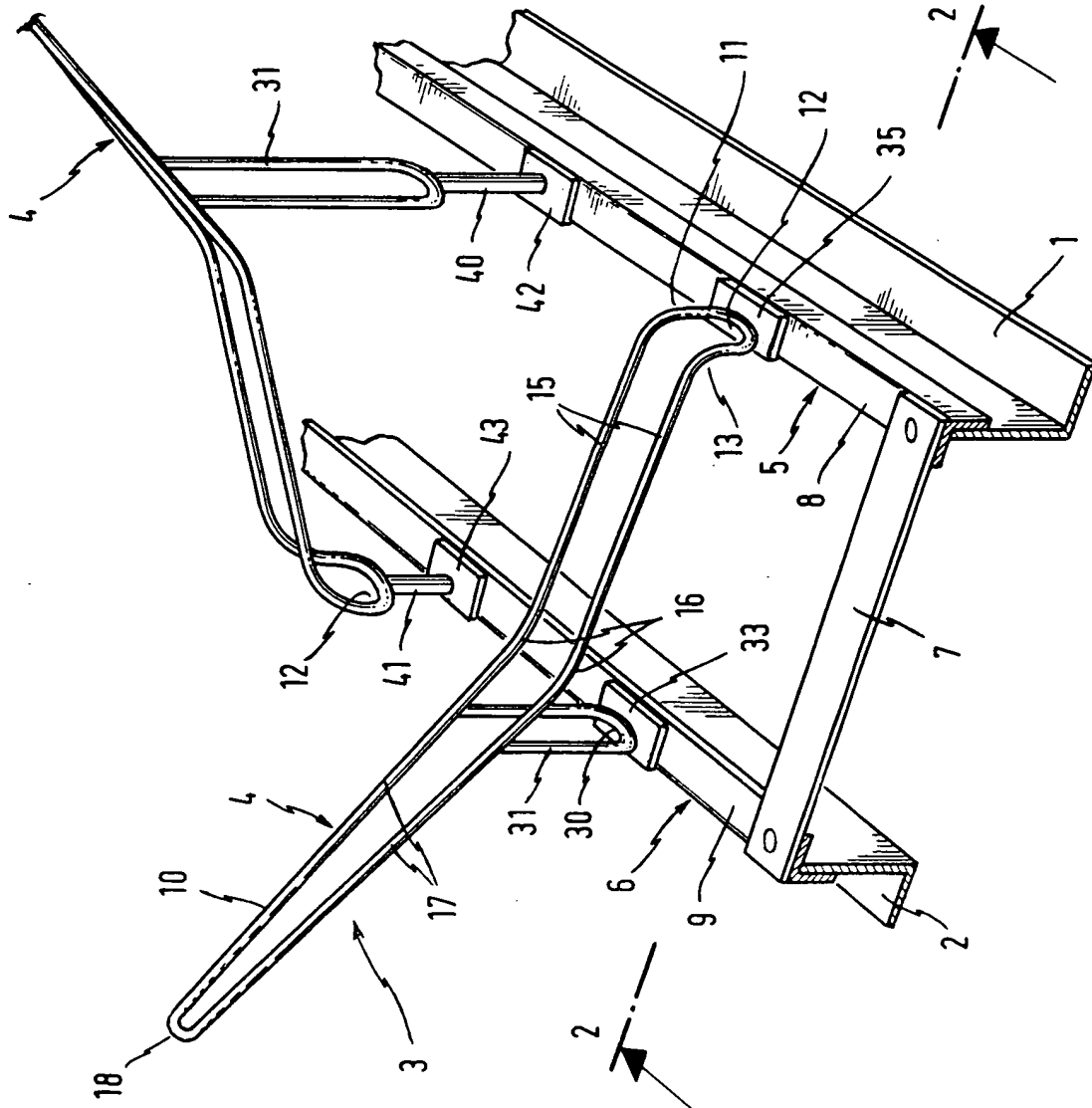
- (54) **Bicycle parking assembly**

- (57) A bicycle parking assembly which comprises one or more stirrup devices (3) which partially enclose the front wheels of each of the bicycles this stirrup having a retaining loop part (17, 17) which converges towards the outer end of the bicycle wheel.

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**FIG. 1**

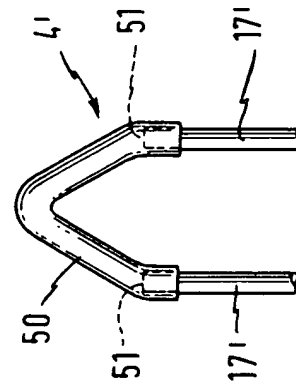
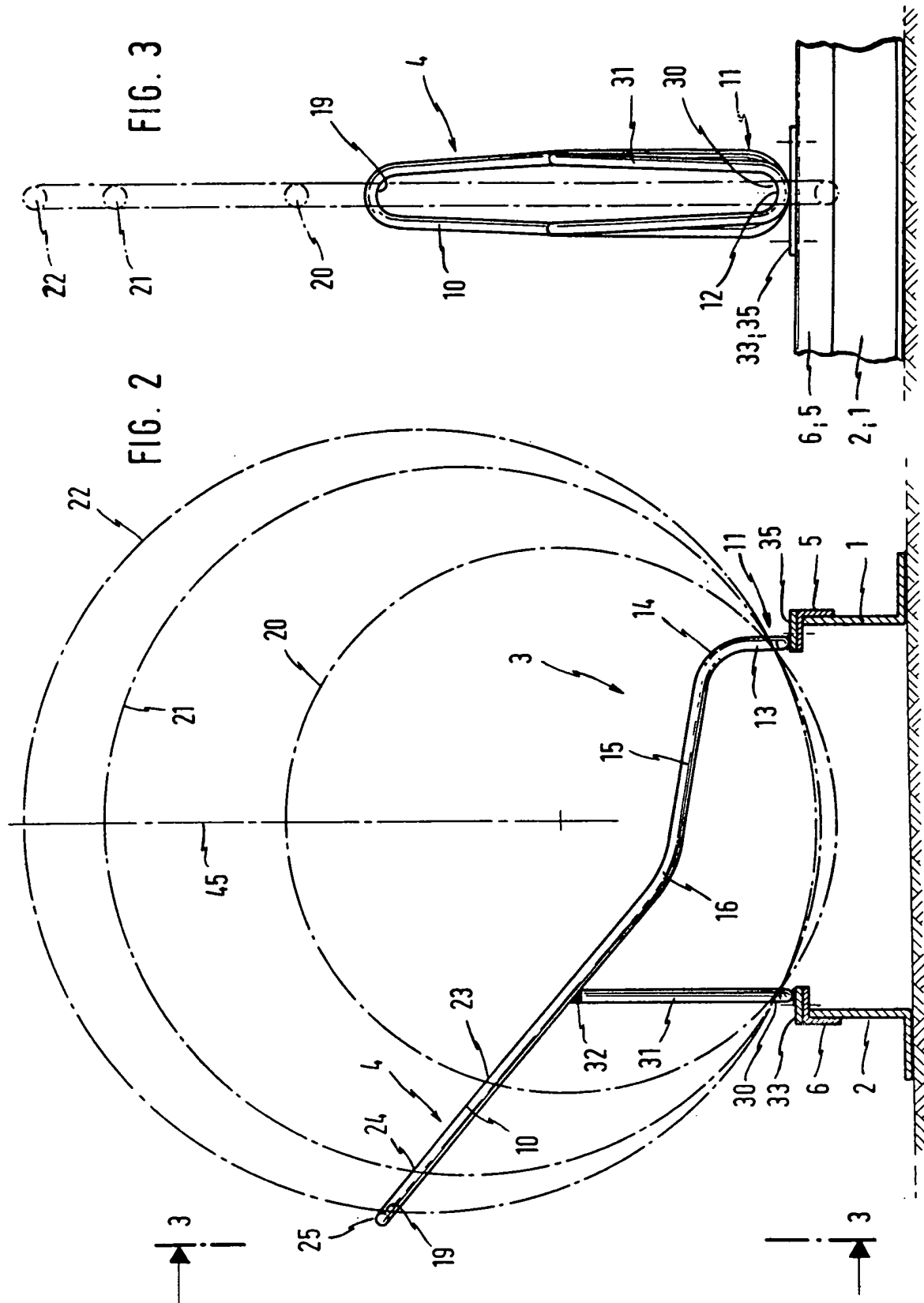


FIG. 4



## SPECIFICATION

## Bicycl parking assembly

This invention relates to a bicycle parking assembly which includes at least one stirrup device in the form of a retaining loop which partially encloses the front wheels of the parked bicycles.

Numerous forms of bicycle parking devices are known, such for example one in which the front wheel of the bicycle is pushed into a retaining device and is held in a substantially stable condition. In this case since the retaining means does not permit turning of the front wheel about the transverse axis of the wheel, the wheel will not tip over.

Because on the one hand the front wheels of bicycles are of different diameters and on the other hand the width of tyre varies greatly it is only possible to use these known parking devices which have their sides parallel to one another, for limited ranges of bicycles i.e. with relatively wide tyres or otherwise those with narrow tyres, such as in the case of racing cycle wheels.

The object of the present invention is to provide a bicycle parking assembly of the kind set forth above of a nature such that it enables bicycle wheels to be held firm and stable where the front wheel size varies and where the width of the tyres differ. This object is met in the present invention by the provision of a bicycle parking assembly comprising at least one stirrup device which receives and partially encloses the front wheel of each parked vehicle, and in which the side parts defining the wheel-receiving cavity in said stirrup device taper towards the end thereof facing away from the parked vehicle.

It is well-known that front bicycle wheels of small radius may have relatively wide tyres, and indeed those with wheels of large radius may have relatively narrow tyres, and in both these cases the mounting in accordance with the invention in all instances ensures a stable and non-tipping mounting of the front wheel and thus of the complete vehicle.

The stirrup device may have at least two side guide parts and these may converge to the end away from the bicycle body. This achieves a two-point support and a mounting at three spaced points and this irrespective of the size of the tyre on the front wheel.

Preferably these side pieces are of rod- or plate-form and these may be secured to a bottom support or foundation. In a modified embodiment the stirrup has two springy arms the ends of which may be resiliently connected; by another feature the stirrup may define a closed loop. It has been found particularly advantageous if the rear supporting part for the front wheel, and the front support of this wheel, are rounded. This ensures that, in contrast with known horizontal types of mounting, the front wheel, and this independently of the tyre width, is supported at a central position on the rounded support. It is preferred to have the two rounded supporting parts of different radii.

If the bicycle parking assembly is to be provided with a means for siting at a stationary place, for example on a rail or a post, the rear rounded supporting part may be flush with the inner rim of the stationary mounting.

It has been found particularly suitable for the retaining loop to be contoured or curved in the plane of the bicycle front wheel. This prevents, as can happen in known forms of bicycle parking assemblies, that by virtue of contact between the free rims of the retaining loops and the noose of the frame the latter can be damaged or at least scraped.

Further to ensure that the hubs of the parked bicycles are disposed in the vertical plane, preferably the rounded supporting parts are arranged at the same level; in particular cases however even a differing level may be used and in particular an arrangement in which the level of the rear supporting part is disposed so that inter alia the room taken up by the inserted bicycle can be reduced.

In a further modified embodiment of the invention the stirrup is approximately perpendicular at its rear rounded supporting part in the plane of the front wheel and this ensures that the inserted end of the front wheel of the bicycle will be at a raised level.

The wheel guide-in means of the stirrup may, but do not necessarily have to be, vertical even when the first-named embodiment described is preferred for aesthetic reasons. Preferably the stirrup device and its parts may be made of steel, aluminium or a plastics material, for example a plastic covered or galvanised steel part of circular or flat section.

A number of stirrups and their guide-in parts may be applied to a transversely-extending rail, for example a profile iron. The stirrup means are advantageously interchangeable one with the next and/or are arranged at varying levels. The stirrup and/or guide means may be detachably secured to the rails. In accordance with a preferred embodiment of the invention the stirrups and guide means are secured, for example welded, to small intermediate fillets such as plates.

Embodiments of the invention are illustrated by way of example in the accompanying drawings and will be described in more detail below. In the drawings:

Figure 1 is a perspective illustration of a part of a first embodiment of the bicycle parking assembly.

Figure 2 is a section taken on the line 2—2 of Figure 1,

Figure 3 is a section taken on the line 3—3 of Figure 2, and

Figure 4 is a detail of a modification.

The embodiment illustrated in Figure 1 is a bicycle parking assembly or stand, generally designated 3, comprising two base angle irons 1 and 2 appropriately connected to a fixed support in the ground. It further comprises a plurality of retaining loops 4 connected with the L-section irons 1 and 2 by means described in more detail

below. It is here to be pointed out that the invention also includes modifications in which the stand comprises one retaining loop or stirrup only and this can be mounted on other types of foundation in the ground.

In the arrangement illustrated the L-irons are connected together at the ends by struts 7 to form a frame. The ground-parallel limbs 8, 9 of the irons 5 and 6 have a row of equidistant holes for receiving threaded nuts.

Each stirrup 4 in the embodiment illustrated comprises a noose 10, for example in the form of a galvanised steel rod preferably of  $1\frac{1}{2}$  cm thickness. This noose 10 is, as can particularly be seen from figure 3, provided at the bottom end 11 with a rounded section 12 to support the front wheel of a bicycle and has a clear radius of 30 mm so that a tyred wheel of a width which is a maximum in practice can be comfortably accommodated.

From the rear rounded supporting part 12 the noose has a rectangularly cranked section 13 followed by a parallel sides section 15 with a width of 100 mm leading to the oblique section 17 with a radius of about 40 mm. A curved section 16 prevents any take-up of the noose 10 with any spoke of the front wheel.

As can be seen more particularly from Figure 1 the two rectilinear parts 17 converge towards the upper end 18 in such a way as to provide a rounded supporting part 18 which has a diameter for example of 18 mm. As a consequence two limbs of the noose 10 continuously converge towards the circular support 18 from 30 to 18 mm.

As can be seen from Figure 2 bicycles with a front wheel 20, 21 or 22 of the usual outer diameters respectively of 50.8 cm, 66 cm or 71.2 cm can be accommodated in the stirrup or in the noose 10 to provide a substantially jolt-free and stable mounting. Since these front wheel sizes are known to have different widths the two limbs 17 of the noose 10 converge more or less in a like degree to the zones 24 and 25, allowing of course for an appropriate degree of play in each case.

The bending of the stirrup devices at 16 is prevented by the fact that the individual sections of the stirrup device extend largely to the centre of the hub of the individual bicycle.

Whilst, as has already been observed the rounded support part 12 provides for the introduction of the front wheel the latter rests on a rounded mounting 30 in its operating position (see Figure 2), the diameter of this support part 30 equalling at this point the diameter at the point 18.

The guide part 31 defining the rounded support part 30 converges from this latter to points at which it is welded to the noose-form loop. As can be seen from Figure 2 the supporting part 18 is used only during the introduction of the bicycle front wheel 22. The operating limbs of the guide part 31 are welded to a platen or plate 33 adapted to be connected for example by screw bolts, to the

flange 9 of the support wall. The rounded support part 12 is welded in a similar fashion to a plate or platen 35 which is connected to the iron 8 through a screw bolt.

As can be seen from Figure 1 a second stirrup device 4 can be provided on the irons 8 and 9 this opening in the opposite direction to the first-mentioned stirrup so that the rounded supporting part 12 thereof is on the other iron from the first-mentioned stirrup.

As can further be seen from Figure 1 the guide part 31 on the one hand and the rounded supporting part 12 on the other can be welded through posts "legs" 40 and 41 or the like with plates or platens 42 or 43 which are similar to 33 and 35 and can be similarly connected to the irons 8 and 9.

As a result of the replaceable mobility of the bicycles on the one hand and varying level of mounting of the stirrups on the other the bicycles may be disposed at a small spacing only but without the handlebars at different heights interfering with one another.

For the sake of completeness it has only further to be mentioned that the two curved supporting parts 12 and 13 are provided at the same level so that, irrespective of the size of the wheels 20—22, their hubs can be disposed in the same vertical plane.

In the modification illustrated in Figure 4 the limbs 17' are not connected by an integral retaining loop but by a member 4' with integral arms which converge and can be spread apart when a bicycle or a front wheel is pressed in. This spreading is opposed by the resilient action of the limbs 17'; the free ends of the limbs 17' are for example provided with an L-shape plastics tip 50 which permits the aforesaid resilient effect but prevents any damage to the free ends 51 of the limbs 17'. These plastic tips 50 may be provided with recesses corresponding to the limbs 17' and can be pushed on to the ends 51 as illustrated.

It is also possible to provide the inner sides of the two stirrups 4 or 4' with slight ribbing or serrations to help engagement with the individual tyres of the front wheels.

Instead of using the stirrups described other guide means can be used to hold the front wheels but these must have the convergence or the convergent features described above. As examples of mounting means of this kind we would mention for example the use of two plates which may be attached in appropriate fashion to a retaining device or rail and converge from the rear wheel support to the front wheel support or to the front wheel mounting.

It is also possible to provide parallel stirrup or retaining plates which at their opposite inner sides are provided with projections, beading or the like, this spacing reducing the distance from the rear rounded supporting parts for the front wheel.

#### CLAIMS

1. A bicycle parking assembly, comprising at least one stirrup device which receives and

- partially encloses the front wheel of each parked vehicle, and in which the side parts defining the wheel-receiving cavity in said stirrup device taper towards the end thereof facing away from the parked vehicle.
- 5 2. A bicycle parking assembly according to Claim 1, in which said side parts are of rod- or plate-form.
- 10 3. A bicycle parking assembly according to Claim 2, in which the side parts are mounted on a base frame, for example through extension pieces.
4. A bicycle parking assembly according to Claim 2 or 3, in which the side parts are a pair of resilient arms.
- 15 5. A bicycle parking assembly according to Claim 4, in which the arms are held together at their convergent ends by a resilient connector.
6. A bicycle parking assembly according to any of Claims 1 to 5, in which the stirrup device is constituted by a closed loop.
- 20 7. A bicycle parking assembly according to any of Claims 1 to 6, in which the front part of the stirrup device supporting the front wheel of the bicycle is rounded.
- 25 8. A bicycle parking assembly according to any of Claims 1 to 7, in which the rear part of the stirrup device supporting the front wheel is rounded.
9. A bicycle parking assembly according to Claim 7 and 8, in which the said front and rear rounded parts are of different radii.
- 30 10. A bicycle parking assembly according to Claim 8 or 9, in which said front and rear parts are disposed at the same horizontal level.
- 35 11. A bicycle parking assembly according to any of Claims 1 to 10, comprising means for attaching it to a foundation.
12. A bicycle parking assembly according to Claim 8 and 11, in which the said rear supporting part is flush with an inner rim part of said attachment means.
- 40 13. A bicycle parking assembly according to any of Claims 1 to 12, in which the stirrup device is bent or rounded in the main plane of the front wheel of the parked vehicle.
- 45 14. A bicycle parking assembly according to any of Claims 1 to 13, in which the stirrup device is substantially vertically disposed in the plane of the front wheel of the bicycle at its rear support.
- 50 15. A bicycle parking assembly according to any of Claims 1 to 14, in which the stirrup device is made of steel, aluminium, or a plastics material, for example a ferrous rod or bar galvanised or plastic-covered.
- 55 16. A bicycle parking assembly according to any of Claims 1 to 15, in which a part of the stirrup device is supported on a transverse base frame comprising profile irons.
- 60 17. A bicycle parking assembly according to Claim 16, in which the stirrup devices are arranged side-by-side and interchangeable at different levels.
- 65 18. A bicycle parking assembly according to Claim 16 or 17, in which the stirrup devices are detachably secured to a base frame composed of the profile irons.
19. A bicycle parking assembly according to any of Claims 1 to 18, in which the stirrup devices are secured, for example welded, to small plates.
- 70 20. A bicycle parking assembly substantially as hereinbefore described and as shown in the accompanying drawings.